WHEAT GROWING IN ARGENTINE.

IN a recent publication on Agriculture and Colonization in Spanish America,[1] Professor Karl Kaerger has collected about fifty reports which he had sent in the years 1895 to 1900 to the Imperial German Foreign Office in his capacity as agricultural expert at the legations in Buenos Ayres and Mexico. In view of the importance which the Argentine republic has gained as a competitor of the United States on the world's wheat market in the last decade, an attempt will be made to discuss the content of those reports referring to wheat culture in Argentine,[2] and with the purpose of attracting attention to this admirable piece of work of Kaerger, the clearness and thoroughness of which deserve the warmest recommendation.

Kaerger's work begins with an estimate of the acreage which in Argentine might with advantage be devoted to the cultivation of wheat. He does not agree with Alois E. Fliess, who in his report, written for the Argentine government (*La Produccion Agricola y Ganadera de la República Argentina en el año 1891*, Buenos Aires, 1893), estimates it as high as 240,000,000 acres,[3] but believes it to be 150,000,000 acres, a figure which he reduces in a report written after a longer sojourn in the country to 120,000,000.

[1] KARL KAERGER, *Landwirtschaft und Kolonisation im Spanischen Amerika* (Leipzig: Duncker & Humblot, 1901). Two vols. 8vo, pp. 939 and 743. First volume, *Die La Plata-Staaten;* second volume *Die südamerikanischen Weststaaten und Mexiko.*

[2] Five reports on *Der Ackerbau in den argentinischen Provinzen Santa Fé und Córdoba* (Vol. I, pp. 1–221), dated between December 31, 1895, and April 25, 1896; one report, *Ueber den vermutlichen Umfang der argentinischen Weizenzone, sowie über den Ackerbau in der Provinz Entre Rios* (Vol. I, pp. 408–438), dated March 8, 1897; four reports on *Der Ackerbau in der Provinz Buenos Aires* (Vol. I, pp. 438–551), dated between May 17 and August 30, 1897; one report, *Ergebnisse des Census: III. Der Ackerbau* (Vol. I, pp. 887–926), dated May 20, 1899.

[3] In the following pages all the foreign coins, weights and measures quoted by Kaerger and others will be given in American equivalents according to the following basis:

1 gold peso	= $0.9648	1 kg.	= 2.2046	pounds
1 mark	= $0.238	1 quintal		
1 £	= $4.8665	1 fanega	= 220.46	pounds
1 ha.	= 2.471 acres	1 dz.		
1 Cuadra	= 4.1685 acres	1 metric on	= 2204.6	pounds
1 hl.	= 2.8375 bushels	1 pood	= 36.113	pounds
1 Winchester bushel	= 0.9694 bushels	1 cm.	= 0.39	inches
1 legua	= 3.22864 miles	1 km.	= 0.62137	miles
1 qkm.	= 0.38611 sq. miles			

The area cultivated with wheat in 1880 amounted to about 300,000 acres.[1] On the authority of Fliess, Kaerger gives as the actual wheat acreage in 1891 3,000,000 acres, while the census of 1888 reported about 2,000,000, and the census of 1895 about 5,000,000.[2] He believes that in 1897 it was not much higher, and that since then it has also by no means increased as much as it did before 1895.[3] It may be noted that Minnesota alone had from 1898 to 1900 also a wheat acreage of 5,000,000, the same as Germany, while the United States had in the last decade a wheat area of about 40,000,000 acres, which is somewhat larger than that cultivated in European Russia with wheat, and about eight times as large as that of Argentine in 1895, but only about one-third of what, according to Kaerger, might in Argentine be cultivated with wheat.

Up to the present time the cultivation of wheat in Argentine has been limited almost entirely to a few districts. The total area of the principal wheat producing provinces and their number of acres culti-

[1] *Cf.* REPÚBLICA ARGENTINA, *Boletín de Agricultura y Ganaderia con las Publicaciones y Resoluciones oficiales del Ministério de Agricultura*, Año I, núm. 12. July 11, 1901, p. 44.

[2] In his pamphlet, *Wheat Growing in the Argentine Republic* (Liverpool, 1895), William Goodwin makes (pp. 57 ff.) the following estimates of the acreage devoted to wheat culture: 1890, 2,700,000 acres; 1891, 3,300,000; 1892, 4,000,000; 1893, 4,600,000; 1894, 5,000,000. He adds. "The land actually under wheat in 1894 was estimated by government returns at 7,500,000 acres, but probably the foregoing estimate of 5,000,000 acres is a safer estimate."

[3] In an additional note Kaerger quotes as an estimate made for 1898–99 by the Argentine Department of Agriculture a wheat area for the four principal wheat producing provinces of only 3,662,650 acres. This figure, however, can only refer to a part of the acreage. I find in a report of the same department for the same year an estimate of 6,163,980 acres. (Ministério de Agricultura de la República Argentina, *Cosecha del año 1898–1899. Datos estadísticos.* Cuestiones de Economia Rural: Informo presentado por Emilio Lahitte. Buenos Aires, 1899, p. 20.) Even this estimate does not include all the land cultivated in wheat. It was made prior to receiving the returns of 678 thrashers, "which, it is believed, will increase the total area to about 7,413,000 acres" (*cf. Monthly Bulletin of the Bureau of American Republics*, March, 1900, Vol. VIII, No. 3, p. 462 f.). *Cf.* for estimates for the years 1899–1900, 1900–1901, and 1901–1902, Ministério de Agricultura de la República Argentina. *Datos estadisticos, cosecha 1899–1900.* Division de Estadistica y Economia Rural, Buenos Aires, 1900, Table V; *Bureau of American Republics*, October, 1900, p. 738 f.; *idem.*, December, 1900, p. 1220; *idem.*, October, 1901, pp. 673 f.; and *The Review of the River Plate*, Saturday, August 24, 1901, p. 297, and November 9, 1901, p. 731.

vated with wheat, according to the census of 1895, will perhaps best be seen from the following table:

Provinces.	Total Area in Square Miles.	Total Wheat Area in Acres.
Santa Fé	50,930	2,547,349
Buenos Aires	117,810	907,959
Entre Rios	28,792	721,799
Córdoba	39,011	725,733
All others	877,623	161,927
Argentine Republic	1,114,166	5,064,767

The four provinces of Santa Fé, Entre Rios, Buenos Ayres, and Córdoba, with an area equal to 21.23 per cent. of the total area of the republic, contained 96.80 per cent. of the total wheat acreage; Santa Fé alone, with an area of about 4½ per cent. of the total area, contained one-half of the acreage.

The greatest drawback of the wheat culture in Argentine is the locusts. They are especially destructive in Entre Rios. Here, but also somewhat in Buenos Ayres, great damage is also done by animals of various kinds. The abundance of organic matter in the soil of these two provinces seems to account for it. The main advantages which the Argentine farmer has over the farmer of northern Europe on account of his warm but not excessively hot climate, are the following: It enables him to carry on agricultural work during the entire year and to obtain two crops from the same soil; it gives him an ampler time for the sowing, so that he can with the same number of hands cultivate a larger acreage, and further can diminish the risk of losing the entire crop by sowing at different times; it enables him to keep the cattle during the entire year in the open air, and to also feed the draught animals permanently on the pasture; it finally saves him the cost of heating his dwelling during the winter. Although the mean temperature in Buenos Ayres is lower than in the other three provinces, the farmer has here, on the whole, the same advantages over the European farmer as in the northern provinces. The great advantage of the Argentine soil over that of northern Europe is its greater fertility, its larger amount of potash and phosphorus. The fertility of the soil seems even to be larger in Entre Rios and also in Buenos Ayres than in Santa Fé and Córdoba. The wealth of the soil in mineral matter saves the Argentine farmer the trouble and cost of fertil-

izing, and allows him, whenever the economic conditions make it appear advisable, to cultivate the whole farm land every year with wheat without diminishing the yield, a practice which is, however, not adhered to in Buenos Ayres on account of the rankness of the soil. The great feature of the vegetation is that, with the exception of a number of spots in Córdoba and Entre Rios covered with bushes and trees, the soil on the whole is covered with low grasses, enabling the farmer to use the plow and keep cattle from the very beginning, and saving him the necessity of providing for roads. On the basis of Sering's studies (*Die landwirtschaftliche Konkurrenz Nordamerikas*, Leipzig, 1887), Kaerger states that while in the virgin forest regions of northwestern United States a regular cultivation of wheat is only possible from six to eight years after the cutting down of the woods, and that the farmer needs ten years in order to clear forty acres of virgin forest, the settler in Argentine can in the first year sow 160 acres of wheat without help. This comparison seems somewhat forced. Even if the above calculation is accepted as true for some exceptional cases, the acreage in the northwest, formerly consisting of virgin forests and now cultivated with wheat, is very small in comparison with the former prairie land which now forms the bulk of the northwestern wheat-belt.

Kaerger regards as one of the main factors in the low cost of the Argentine wheat production and its rapid progress, the fact that no stronger plow is necessary for the breaking up of the virgin land than for the working of the land already in cultivation. The only difference is that while the plowing of the old land can be done with two pair of oxen, the breaking of the new land requires three pair and a somewhat longer time. The depth of the furrow is generally on an average only four inches, with the exception of western Córdoba, where it is from six to eight inches, while in Germany it is seldom less than the latter, and in intensive cultivation from twelve to fourteen inches.[1] A double plow breaks about 2½ to 3 acres of new land per

[1] In the North American Pacific coast wheat region, with the exception of Oregon, where the method of preparing the land for the crops is more like the Eastern plan or that of the Middle West, the depth of the furrow is only about three inches. (*Cf.* United States Department of Agriculture, Division of Statistics, *Miscellaneous Series · Bulletin No. 20. Wheat growing and general agricultural conditions in the Pacific coast region of the United States*, by EDWIN S. HOLMES, JR., Washington, 1901. Pp. 24, 28, 31).

day; it plows 4.2 acres of old land[1] against only 1¼ acres in Germany. The quantity of the seed is generally from 33 to 42 pounds, in only a very few cases more than 50 pounds to the acre,[2] while it is in Germany from 140 to 200 pounds.[3] While, therefore, a man can sow in a day with the hand in Germany but 7½ acres, he can in Argentine, as a rule, cover from 15 to 21; in Western Córdoba and generally in Buenos Ayres from 10½ to 12½ acres. With a broad-cast wheat sower — which, however, is not generally used in Western Córdoba, and very little in Buenos Ayres — the Argentine farmer can sow about 33 to 42 acres, with the exception of Western Córdoba, where he will only succeed in covering from 25 to 30 per day. He harrows as a rule 15 to 21 acres per day, in Western Córdoba and Buenos Ayres only 10½ to 12½, but in Germany not more than 3 acres. Harvesting is generally done with mowing machines. Headers, which are generally used in Santa Fé and Eastern Córdoba, and to a large extent in Western Córdoba, cut in the former districts from 25 to 42 acres per day; in the latter only 21, at the utmost 25 to 30. Binders, which, on account of the smaller size of the agricultural unit in Buenos Ayres, are almost exclusively used in this province, but which are common also in Entre Rios, and are likewise found in the other two provinces, mow on an average from 12½ to 21 acres. The thrashing is generally done with steam thrashing machines. Kaerger is of the opinion that if the California combined harvester and thrasher could be used here, the cost of production of wheat in Argentine would be enormously diminished. The reason for the smaller area covered per day in Western Córdoba, compared with its eastern district and Santa Fé, is the weakness of the draught animals, and in mowing in addition the inefficiency of the laborers, the effect of which is offset by the lower wages and lower prices of cattle in the former district. The larger amount of work done in Argentine compared with Germany, is due in plowing and harrowing to the stronger team, plowing besides being less thorough; in sowing to the smaller quantity of seed; in mowing to the use of machines

[1] In his chapter on "Wheat Farming in Santa Fé," Goodwin (*loc. cit.*, p. 18) says: "By working fifteen or sixteen hours one man can plough . . . . four to five acres on broken land with a double plough."

[2] Goodwin seems to count one bushel per acre (*cf. loc. cit.*, p. 58).

[3] The average amount of wheat sown per acre in the Pacific coast region is estimated at seventy pounds (*cf.* HOLMES, *loc. cit.*, p. 21).

which Kaerger warmly recommends to his countrymen as an important factor in the superiority of the transoceanic competition. The yield per acre averages in Santa Fé and Córdoba from 635 to 795 pounds;[1] in Entre Rios about 900 pounds seems to be the average crop,[2] while in Buenos Ayres it is about from 950 to 1,070 pounds.[3] In a later report, however, Kaerger is inclined to consider 1,070 pounds, which he gives as the average crop for Germany, the poorest soil excluded,[4] as the average for the whole of Argentine.[5]

In the decade 1891 to 1900 the average annual output per acre was about the same as the one given for Santa Fé and Córdoba in Missouri (695 pounds), Kentucky (714), California (730), Nebraska (734), North Dakota, Indiana, and Kansas (763), Texas (764), Illinois (789), the average for the United States being at the higher limit (796). It was higher than in Santa Fé and Córdoba, but somewhat lower than in Entre Rios in Michigan (845), Minnesota (853), Wisconsin (871), Iowa (881). The output of Pennsylvania (925) exceeded the average of Entre Rios, while a similar high crop, as in Buenos Ayres, was

[1] Goodwin (*loc. cit.* p. 31) mentions that "it has been customary to consider that the average of Santa Fé is not over 10 to 11 bushels per acre (similar to United States average)." The yield per acre in 1899 and 1900 was estimated in Santa Fé at 688 and 691 pounds; in Córdoba 827 and 652 (calculated from *Cosecha del año 1898–99*, p. 20; *1899–1900*, Table V).

[2] The yield per acre in 1899 and 1900 was estimated at 822 and 687 pounds (*cf. ibid.*).

[3] The yield per acre in 1899 and 1900 was estimated at 1,070 and 972 pounds (*cf. ibid.*).

[4] This figure for the yield per acre of wheat in Germany is somewhat too small. According to the estimates made in the corresponding years by the communal authorities, the yield per acre varied in the years 1885 to 1898 between 1,080 pounds (1889) and 1,490 pounds (1898). Later investigations by agricultural experts, however, have shown that the estimates of the communal authorities were from 10 to 15 per cent. too small. The recent official estimates give for the average of the years 1893 to 1899 an output of wheat per acre of 1,561 pounds, for 1900 an output of 1,668 pounds (calculated from *Statistisches Jahrbuch für das Deutsche Reich*, Vol. XVIII. Jahrgang, 1897, p. 31; Vol. XXI, Jahrgang, 1900, p. 22; Vol. XXII, Jahrgang, 1901, p. 18).

[5] Goodwin (*loc. cit.* p. 31) gives 13 bushels as the probable yield per acre for the entire country; in the *Summary of Commerce and Finance of the United States* for August, 1901, p. 510, the average yield per acre is given as 15 bushels. Goodwin, (pp. 58 f.) estimates the average yield per acre for the country at large, in the years 1890 to 1894, to 12, 11, 14.5, 18, 11.5 bushels. In the years 1899 and 1900 the yield of wheat per acre in the four leading provinces was estimated to 821 and 753 pounds per acre (calculated from *Cosecha del año 1898–99*, p. 20; *1899–1900*, p. 22).

reached in Maryland (955), New York (1050), Oregon (1064), a yield similar also to that of Austria (983) and Hungary (1,102) in the six years 1894 to 1899. A higher output was even reached in the above decade in Washington (1,194), Colorado (1,248), and also in the above six years in France (1,134), and especially in the United Kingdom (1,873), while of the main wheat-producing states only South Dakota (624), and Virginia (625), and of foreign countries, for example, Russia (558) had a smaller output than the average acre in Santa Fé and Córdoba.[1]

Comparing the proportion of the crop to the seed in Santa Fé and Córdoba and in Germany, Kaerger finds that it was in the latter country much smaller, being only 6 to 8 times as large (according to the above quoted figures really only 5 to 7 times) against from 12 to 20 in the two Argentine provinces.[2]

The farmers in the provinces of Santa Fé and Córdoba are partly "medieros" who receive from the land-owner the land and the implements and have to deliver to him one-half of the crop; partly renters who work with their own implements and pay to the owner either a rent in gold or a percentage of the output; partly independent colonists. If we except a very few large land-owners cultivating their farms themselves, the size of the farms cultivated by these three classes is on the whole the same, being as a rule 417 acres. In the province of Entre Rios where besides the number of "medieros" and renters is small, the size of the average farm is 494 acres. In these three provinces about 20 per cent. of the farm is devoted to pasture. In Buenos Ayres the conditions are entirely different. The number of "medieros" and of colonists is very small, most of the soil belonging to large land-owners who rent it out in small tracts. On an average a renter gets

[1] Calculated from *Yearbook of the United States Department of Agriculture*, 1900. p. 768; one bushel being considered equal to 60 pounds. *Cf.* for the average yield in foreign countries also *Das Setreide im Weltverkehr*. Vom k. k. Ackerbauministerium vorbereitete Materialien für die Enquête über den börsemässigen Terminhandel mit landwirtschaftlichen Producten, Vols. I and II.

[2] Charles Wiener (Ministère des Affaires Étrangères, Missions Commerciales, La République Argentine, Paris, 1899, p. 320) estimates the average crop in the province of Buenos Ayres at 13 times the amount of the seed. In the Pacific wheat region (California, Oregon, Washington, Idaho) the average yield per acre varied in the years 1882 to 1900 between 11.7 and 17.7 bushels (*cf. loc. cit.* p. 37). The average seed being estimated at 70 pounds per acre, the crop was thus from 10 to 16 times as large as the seed.

about 247 acres out of which he does not devote more than one-sixth to pasture.[1]

The old colonial population of Argentine emanating from the mixture of Spaniards and Indians cultivated the land only to a very limited extent. Up to the end of the sixties, Argentine had to import flour from Chili and North America. The change was only brought about by the immigration of Europeans. Even at present very few of the natives of Argentine are agriculturists, the land being cultivated almost exclusively by Europeans and their descendants, a large majority being Italians. The opinion prevailing in the cities of Argentine is that the Italian farmer is both extremely industrious and economical. Kaerger says that his obversations in the field did not lead him to the same conclusion. The Italian is industrious only during the time of the sowing and harvesting; he does nothing during the rest of the year. He is economical only in so far that he avoids incurring more debts than he is sure he will be able to pay after the harvest; that he is extremely temperate in regard to the consumption of alcoholic beverages; and that he also eats very little meat. But the Italian living on a slice of bread and a few onions is only a legendary person. He praises the sensible economy of the Italians during the first years of their stay and their habit of conforming to the usual food of the country, the imitation of which virtues he warmly recommends to the German immigrants. But he disapproves of the Italian keeping up his habits after he has become wealthy and is inclined to characterize him as being during his whole life merely an "animate wheat producing machine." A peculiarity of the provinces of Entre Rios and Buenos Aires is the colonies of German Russians whom Kaerger classes as extremely industrious and indefatigable, but as superstitious, little inclined to deviate from their traditional methods and especially distrustful. There are besides to be found in Santa Fé, Buenos Aires, and especially in Entre Rios colonies of Russian Jews established by Baron Hirsch which Kaerger describes as very successful, a fact which is the more noteworthy as at the start most of the immigrants had occupations not especially fitting them for country life.

Kaerger pays especial attention to the development of the railways in Argentine. He states that the costs of construction were given for 1893 as being $53,000 per mile, about the same rate as in Canada,

[1] *Cf.* for the size and tenancy of the farms in Argentine Kaerger's analysis of the Argentine census of 1895 and especially for the farms cultivated in wheat in 1898–99, *Monthly Bulletin of the Bureau of American Republics*, March, 1900, pp. 462 ff.

against only $29,000 for the South African lines constructed under similar favorable conditions as those in Argentine,[1] but against $58,000 in the United States[2] and about $100,000 in Germany.[3] But he thinks that the disproportion between the great length of the lines and the small total of persons and goods carried in Argentine together with the high cost of the coal, which is all imported,[4] would naturally lead the railways to fix higher rates than the American or German. This tendency however was checked by the severe competition between the lines. The great extent of the railways and their close network had this additional advantage to the farmer of extremely facilitating for him the sale of his products. Kaerger shows that in the entire province of Santa Fé there are 4.1 miles of railway per 100 square miles and in Córdoba 3.1 miles.[5] In the central wheat region of Santa Fé, which is at the same time the main wheat region of the entire country, and covers about 19,500 square miles, there are 1,550 miles of railway or 7.96 miles per 100 square miles, and in the main wheat region of Córdoba, covering about 21,600 square miles, nearly 700 miles of railway, or on an average 3.22 miles per 100 square miles. The number of stations in the same region of Santa Fé was 186, or on an average one station for somewhat more than 100 square miles. If this area is supposed to be a circle it would have a radius of 5.8 miles, this distance representing the theoretical average distance which each farmer would have to haul his wheat to the nearest railway station. In the wheat region of Córdoba, where the number of stations was 61, or on an average one station for about each 350 square miles, the corresponding radius is 10.6 miles. In 1895, in a selected part of northeastern Germany, likewise producing almost exclusively agricultural products and also

[1] In fact the capital per mile of line in Argentine varied in the years 1892 to 1899 between $51,183 (1899) and $53,511 (1894). (Calculated from *Estadística de los Ferrocarriles en Explotación Año 1895*, p. 32; *1897*, p. 36; *1898*, p. 39; *1899*, pp. 45, 217.

[2] The total capital per mile of line in the United States varied in the decade 1890 to 1900 between $59,610 (1895–96) and $63,776 (1891–92). (*Cf. Interstate Commerce Commission, Thirteenth Annual Report, on the Statistics of Railways in the United States for the Year Ending June 30, 1900*, p. 53).

[3] The total capital invested per mile varied in the decade from 1889 to 1899 between $95,900 (1889–90) and $97,100 (1898–99) (calculated from *Statistisches Jahrbuch für das Deutsche Reich*, Vol. XXII. Jahrgang, 1901, p. 44).

[4] The average cost per metric ton of coal used by the railways in 1897 was $6.85, in 1898 $7.04, in 1809 $6.79 (*cf. Estadística de los Ferrocarriles, 1897*, pp. 128 f.; *1898*, pp. 130 f.; *1899*, pp. 144 f.), or about three times as high as in the United States.

[5] The figure in Kaerger is given as 1.11 km. per 100 9km, evidently a misprint for 1.91 km.

having in common with this part of Argentine a long water front, the radius was 3.6 miles. In an effort to eliminate the error arising from the fact that the farmer generally cannot haul his wheat in a straight line to the nearest railway station, Kaerger comes to the conclusion that in fact the farmer of the central wheat region of Sante Fé has to haul his wheat on an average 7.3 miles, in the wheat region of Córdoba 13.5 miles, in the selected part of Germany 4.5 miles.

He then discusses the freight rates for wheat on Argentine railways. He states that the companies charge varying rates according to the value of the paper money, and calculates the following table showing the rates in paper pesos for 1,000 kilograms of wheat, charged by seven companies in 1894 for different distances, the gold peso being equal to three and to four paper pesos:[1]

Name of Road.	300 Paper Pesos = 100 Gold Pesos.			400 Paper Pesos = 100 Gold Pesos.		
	100 km.	200 km.	300 km.	100 km.	200 km.	300 km.
Central Argentino	4	7	10	5.20	9.10	13
Buenos Aires y Rosario	4.65	8.45	12.25	5.88	10.68	15.48[2]
Provincia di Santa Fé	5.80	9.21	12.63	7.32	1164	15.96
Oeste Santafecino	6.50	13	19.50	6.50	13.	19.50
Buenos Aires al Pacifico	4.50	7.20	9.90[3]	5.75	9.20[4]	12.65[5]
Villa Maria a Rufino	3.96	6.12[6]	8.28	5.06	7.82	10.58
Andino	2.25	4.50	6.75	2.25	4.50	6.75

These rates expressed in cents per net ton of wheat per mile were the following:

Name of Road.	300 Paper Pesos = 100 Gold Pesos.			400 Paper Pesos = 100 Gold Pesos.		
	62 miles.	124 miles.	186 miles.	62 miles.	124 miles.	186 miles.
Central Argentino	1.878	1.643	1.565	1.831	1.602	1.526
Buenos Aires y Rosario	2.186	1.985	1.918	2.071	1.880	1.817
Provincio di Santa Fé	2.723	2.169	1.978	2.578	2.053	1.873
Oeste Santafecino	3.052	3.052	3.052	2.289	2.289	2.289
Buenos Aires al Pacifico	2.113	1.690	1.549	2.025	1.620	1.485
Villa Maria a Rufino	1.859	1.437	1.290	1.782	1.377	1.242
Andino	1.056	1.056	1.056	0.792	0.792	0.792

[1] The average annual price of gold in 1894 was 357. (*Cf. Review of the River Plate*, Saturday, January 4, 1902, p. 191.)

[2] Kaerger erroneously gives 14.48.

[3] Kaerger erroneously gives 8.90.

[4] Kaerger erroneously gives 9.10.

[5] Kaerger erroneously gives 12.55.

[6] Given in Kaerger's table as 5.12 — evidently a misprint.

The rate per ton of wheat per mile charged by these railways varied then in 1893 at a value of the paper peso equal to one-third gold peso between 1.056 and 3.052 cents and at its value equal to one-fourth gold peso between 0.792 and 2.578 cents. Kaerger shows that the rates varied on the first three mentioned lines with an especially extended wheat traffic between 1.565 and 2.723 cents (paper at 300) and between 1.526 and 2.578 (paper at 400). He states that these rates were much higher than those charged in Germany, which according to his figures were per net ton per mile at a distance of 62 miles 1.216 cents, at a distance of 124 miles 0.973 cents, at a distance of 186 miles 0.900 cents. He further states that they were especially much higher than in the United States where 100 pounds of wheat were carried from Chicago to New York in January, 1890, for 25 cents and in July, 1890, for 22½ cents, which corresponds to a rate per ton per mile of 0.548 and 0.493 cents.[1] But he believes after all that the transportation is much more favorable for the agriculture of Argentine than for the North American; the wheat region of Argentine having the long water front which makes the distance to be sent by railway to the shipping port very much shorter than in North America. These water ways, the ocean, the Uruguay and the Paraná afford also the advantage of a large number of ports. He comes to the conclusion that the average rate of transportation for the wheat crop from Santa Fé and Buenos Ayres to the ocean amounts to $2.40 per metric ton, from Cordoba to $3.20 against about $5 (1890) from Chicago to New York alone and to at least $7.15 to $8.30 for the average transportation from the local railway station to the ocean; that this disadvantage is by no means offset by the smaller distance from North America to Europe, the rate for the ton of wheat from New York to England being, it is true, only on an average $2.40, but also in Argentine sometimes only $2.85 and usually from $3.55 to $4.75; the railway and ocean freight rates together being thus for the North American wheat about $9.50 to $10.70 against $6 to $8 for the Argentine.

When, however, Kaerger says that the difference between the

[1] Like practically all other foreign writers comparing grain rates in the United States with those of other countries, Kaerger thus bases his conclusions upon the railway charges from Chicago to New York. This rate, however, being a competitive rate of the most intense kind, cannot be taken as an average grain rate for the United States, and as it is, moreover, a long-haul rate from a primary market to the ocean, it cannot be compared with the charges for the short distances which the Argentine wheat has to be carried directly from the local railway station to the shipping port.

freight rates from the United States and Argentine has largely contributed to the rise of the Argentine agriculture, as entirely benefiting the farmer, this conclusion seems somewhat hasty, as the freight rate is only one of the factors influencing the profit of the farmer. Kaerger, although not attempting to compare them for both countries, is quite aware of the importance of these other factors. In fact, he thoroughly discusses the methods of the grain export trade which is largely in German hands, the insufficient arrangements for the storing and cleaning of grain, and the grain inspection. He makes a very careful and elaborate investigation of the different costs of production of wheat in the various provinces for old and new land for the different systems of management, of tools employed, of monthly wages, of days of work during the month, of yield. He adds a detailed investigation of the costs of trade and of transportation of the wheat from the producer to Europe for the different rates of paper currency, and of the gross profit of the producer for the different prices of wheat on the European market, and by combining these results with those found for the costs of production of wheat under various conditions, he gives a lucid insight into the conditions under which wheat growing in Argentine is profitable and able to compete in German markets with German wheat.

	Cents.	
	Per Acre.	Per Bushel of 60 Lbs.
Costs of 417 acres of land, at $4.80 the acre, = $2,000; interest at 8 per cent. ($160) distributed among the 333 cultivated acres....	48.0	3.89
Costs of buildings, etc., $166.67; interest at 8 per cent. ($13.33), distributed as above...	4.0	0.32
Costs of implements and machinery $866.67, annual depreciation at 10 per cent. ($86.67)	26.0	2.11
Costs of draught cattle, $366.67; depreciation 10 per cent. ($36.67).....	11.0	0.89
40 to 53 pounds of seed ($13.33 to $20 per ton)	24.0 to 48.0	1.95 to 3.90
Plowing, sowing, harrowing.....	14.0 to 33.6	1.13 to 2.72
Mowing	33.6 to 100.0	2.72 to 8.11
Thrashing	58.2 to 156.7	4.72 to 12.71
Sacks (6 cents per 100 pounds).....	44.8	3.63
Insurance.....	16.8	1.36
Land tax	2.4	0.19
Wheat tax (1½ cents per 100 pounds)	11.2	0.91
Total	2.94 to 502.5	23.83 to 40.74
In addition breaking of new land.....	12½ to 57	1.01 to 4.60
Total	$3.065 to 5.595	$24\frac{5}{6}$ to $45\frac{1}{3}$

It will perhaps be useful to compile Kaerger's results for at least one example for which may be taken a farmer of Santa Fé owning 417 acres, of which 80 per cent., or 333, are cultivated with wheat, who has all the work done by farm hands, to whom he pays $10, or $13⅓ per month, and during the harvest $25, or $33⅓ per month, whose board costs him $5 per month at ordinary time, and $8⅓ in harvest time, and who work twenty or twenty-five days per month, the yield per acre being 740 pounds, all valued in gold, the value of the paper being ⅓ of the gold (exactly, 1 paper peso = 33⅓ cents). The costs then vary according to the above conditions and the use of different tools, as shown in the table on preceding page.

This makes per metric ton on old land, $8.75 to $14.95; on new land, $9.15 to $16.65. Kaerger finds as an average for the metric ton on old land, $12.27; on new land, $13.33. This makes per bushel on old land, 33⅓ cents; on new land, 36.3 cents. In order to simplify the calculations three-fourths may be counted as old land and one-fourth as new land:

Total Cost of Production to the Farmer.	Per Metric Ton.	Per Bushel of 60 Lbs.
Total cost of production to the farmer.....	$12.50	34.0
Cost of hauling the wheat to the railway station (7.3 miles).....	0.67	1.8
Commissions of the local dealer (including unloading and loading, etc.).....	0.50	1.4
Railway charges.....	2.50	6.8
Loading at the seaport	0.50	1.4
Ocean rates to Hamburg.....	5.00	13.6
Commission of the importer (10 per cent. of the price in Buenos Aires plus ocean rate, if the former is $20).....	2.50	6.8
Total	$24.17	65.8

At a price of $25 per metric ton of wheat in Hamburg (68 cents per bushel), that is $33.33 including the duty, at which, according to Kaerger, the German agriculturists could cover their costs of production, but in very favorable cases, the farmer in Argentine would get on his farm $13.33 per ton and then still have a small net profit amounting to 83 cents per ton (2¼ cents per bushel), and $93 for his entire wheat crop; at a price of $33 (in Hamburg)—the average price of the Argentine wheat in the English market in the years 1896 to 1900—which would probably involve a similar increase in the price

at Buenos Ayres and increase the charges of the importer by about 80 cents, he would get $20.53 per ton or $8.03 over his expenses (21⅝ cents per bushel), and $900 for his entire crop.

It will be interesting to compare with the above selected example an estimate recently published by a land company of Buenos Ayres owning land in the southern part of the province of Buenos Ayres. The portion of the article which bears on the subject reads as follows:

Estimated cost of growing wheat in Argentina 1900–1901, calculating at the produce of 1,500 kilos per cuadra (4 acres) [793.3 pounds per acre],[2] which produce has been exceeded for the past two years in the south.

(On new well-tilled land 2,500 to 3,000 kilos is often produced.)

Expenses are made up on the current rate paid for such work by contract.

		United States Coin.	Cents.	
			Per Acre.	Per Bushel of 60 Pounds.
Rent of 1¼ leagues (2,000 cuadras at $4 per cuadra) [8,337 acres at 40.8 cents per acre]	$ 8,000	$3,400	51[3]	3.86
Tillage, 1 league (1,600 cuadras) [6,670 acres], at $6 per cuadra [61.2 cents per acre] (leaving ¼ league for cattle, etc.)...	9,600	4,080	61.2	4.63
Seed, 100 kilos per cuadra [53 pounds per acre] at $65 [$27.625] per ton.....	10,400	4,420	66.3	5.01
Cutting, stacking, etc., at $1.20 per cuadra[2] [$510 per ton].....	1,920[4]	12,240	183.5	13.88
Expenses; peones, etc., at $40[5] per cuadra..	640	272	4.1	0.31
Thrashing and bagging at $1 per 100 kilos [$4.25 per ton]	24,000	10,200	152.9	11.57
Cartage to rail, 2 to 3 leagues [6,457 to 9,686 miles] at $0.40 per 100 kilos [$1.70 per ton]	9,600	4,080	61.2	4.63
Railway freight, 255 kilometers [158.5 miles] at $0.76 per 100 kilos [$3.23 per ton].....	18,240	7,752	116.2	8.79
Bags, 31,200 at $0.20 [8½ cents], each	6,240	2,652	39.8	3.01
Guia tax, at $0.09 per 100 kilos [38 cents per ton].....	2,160	918	13.8	1.04
Total cost.....	$90,800[4]	$50,014	$7.50	56.73
Produce, at 1,500 kilos per cuadra, 2,400 tons at $65 [$27.625] per ton, f. o. b., Dársena or Bahia Blanca.....	$156,000	$66,300	$9.94	75.19
Yearly profit.....	$65,200[4]	$16,284	$2.44	18.46

[1] *Cf. Review of the River Plate*, Saturday, May 11, 1901, p. 29.

[2] In order to facilitate a comparison with the above given example, I have added the same equivalents for the measures, weights, and coins.

[3] Distributed among the 6,670 cultivated acres. [5] This should be $0.40 per cuadra.

[4] In a letter dated May 17, 1901, and addressed to the editor of the *Review of the River Plate* (Power & Co.), state "that there is a clerical error in the item of cutting,

Argentine paper	$ 1.00 = 1s. 9d. [= 42½ cents]
Cost per acre	11.35 = 19s. 10d.[1] [$7.50]
Produce per acre	19.50 = 35s. 1d. [$9.94]
Profit per acre	8.15 paper = 15s. 3⅝d. [$2.44]
United States gold	1.00 = 4s. 2d.

ON EIGHT YEARS' AVERAGE.

Cost per acre	$3.77 = 15s. 9d. sterling
Produce per acre	5.93 = 24s. 11d. sterling
Profit per acre	2.16 gold = 9s 2⅝d. sterling

The rent of the lands as above may be considered very low. In the north of Buenos Ayres province good land near port is worth $14 per cuadra, but the lands on which we base our calculation are in our hands to let at the price given, but are situated 250 kilometers from two seaports. Consequently there is heavier rail freight to pay.

The cost of tillage is estimated on the average of three or five years; breaking the land the first year would probably cost more than $6. We know a case in which $7 was paid this year by contract for this work.

Seed. The quantity used depends on the land, and some colonists may use more than we have given. In fact, estimates we have got varied from under 100 to over 200 kilos per cuadra.

Cutting, thrashing, etc., includes hired help (*peones*). A colonist with sufficient capital to furnish his own outfit would reduce this expenditure very materially. In fact, the cost of outfit would be repaid in two years, the plant remaining good with due care.

The produce of 1,500 kilos per cuadra is more than the average of the last season for the whole area grown, but we work on new land well tilled, and in the south of the province, which we consider the best for wheat growing, except there is more risk of late frosts, same as in the Canadian Northwest territory, where the best wheats are produced in North America.

This estimate deserves special attention, as it gives on the whole, and for some items very considerably, higher costs of production than

stacking, etc., at $1.20 per cuadra. This should be $1.20 per 100 kilos, or $28,800 instead of $1,960 (should be $1,920). This would raise the total cost from $90,800 to $117,680, and decrease the yearly profit from $65,200 to $38,320. The cost per acre would raise from $11.35 = 19s. 10d. to $14.71 = 25s. 9d., and the profit per acre decreases from $8.15 = 15s. 3⅝d. to $4.79 = 8s. 4⅜d., a profit similar to the one given for the eight years' average.

[1] In order to facilitate a comparison with the above given example, I have added he same equivalents for the measures, weights, and coins.

those in the example selected from Kaerger.[1] Entering into the details would necessitate a fuller discussion, first, of the difference in conditions in Santa Fé and Buenos Ayres, and, second, of the varying costs for a land-owner and a renter. It further would involve a treatment of the influence of the increase in the value of the paper money which occurred between the years in which the estimates were made, all questions which it would be impossible to treat within the scope of this article, but for the study of which Kaerger's work furnishes rich material.

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[1] *Cf.* for other estimates: GOODWIN, *loc. cit.*, pp. 29–35 a. o.; WILLIAM BLYTH, *Farming in Argentine* (Dundee, 1896), pp. 59 f.; WIENER, *loc. cit.*, pp. 54 f. a. o.; *Consular Reports*, Vol. XLIX, No. 183, pp. 460–77 (WILLIS E. BAKER, *Transportation of Wheat in the Argentine Republic*); Ministério de Agricultura de la República Argentina, *Memórias de las Direcciones de Comércio é Industrias, Tierras y Colonias, Agricultura y Ganaderia é Inmigracion* (Buenos Aires), 1899, p. 135.